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# United States Department of Agriculture,

BUREAU OF PLANT INDUSTRY,

Forage-Crop Investigations,

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## DRY-LAND ALFALFA.

The strain of alfalfa discussed in this circular was developed under dry-land conditions in the Great Plains region.

There is little doubt that seed of alfalfa grown without irrigation and under conditions of light rainfall for several generations is better suited to semiarid sections than seed produced in a more humid climate. By virtue of the crop having been grown under extreme, or at least severe, conditions, a large percentage of the weaker plants have been eliminated, leaving the more drought-resistant ones to perpetuate the strain. There are several so-called varieties that are said to be more resistant to drought than the common alfalfa. Among those most commonly mentioned are Turkestan and sand lucern. However, the superiority of these and other strains over the ordinary variety that has been grown for a number of years on dry land has by no means been definitely demonstrated. For the sections of Texas, Oklahoma, New Mexico, and Kansas, where the rainfall is scant, the regional strain, if such it may be called, which is referred to in this circular has shown itself to be equal if not superior to any strain that is now on the market.

In the localities where precipitation is light, the methods used in the culture of alfalfa have frequently more to do with success than the variety that is sown. Improvements in methods of dry-land farming and improvement in the variety by selection, either natural or otherwise, has made it possible to grow alfalfa in sections heretofore considered too dry for its profitable utilization. The use of improved seed should always be accompanied by improved methods, and the mistake should not be made of treating good seed carelessly merely because it is of a strain more resistant to drought than the common strain.

*Seeding in cultivated rows.*—There are two general methods by which alfalfa may be seeded on dry land—broadcast and in rows. Broadcasting is still more commonly practiced but growth in rows is gaining rapidly in popularity and is without doubt the coming method.

Where the crop is to be grown for either hay or seed the cultivated-row method is highly recommended. It is not only a much surer method of securing a stand but it is much more certain of maintaining a stand where moisture is scarce.

For seeding in rows it is just as essential that the seed bed be as thoroughly prepared as in the case of broadcast seeding. If the seed is to be sown in the spring it is advisable in most cases to plow the ground during the preceding fall, leaving it rough in order to hold the snow and prevent blowing. Beginning early in the spring, repeated disking and harrowing should be given to thoroughly settle the subsurface, also to induce the germination of weed seeds and to destroy as many weed seedlings as possible. If the crop is to be seeded in the fall the ground should be plowed early in July and treated in the same manner as in the case of spring seeding.

These points should be always borne in mind; the surface of the seed bed should be thoroughly fined, to furnish suitable conditions for the germination of the seed and to conserve moisture; the subsurface should be well settled to assist in the conservation of moisture and to promote the growth of the young plants; and the field should be made as free from weeds as possible, in order to give the young alfalfa the necessary advantages of moisture and light.

On land that is real sandy the method of preparing the seed bed should be modified so as to reduce the effect of blowing to the minimum, the number of workings to be determined by the character of the soil and the probability of its blowing.

*Date of seeding.*—The best date for seeding depends largely on the locality, and since there is already considerable experience in this regard the farmer is advised to follow the practice of the most successful alfalfa raisers in his community. As a general rule, however, early fall seeding is commonly advised in the southern portion of the Great Plains region, and for the northern part spring seeding usually gives the best results.

*Rate of seeding in rows.*—For both hay and seed production the wide row is preferable to the narrow row, and a thin, uniform stand to a thick stand. It is recommended that the rows be 36 to 42 inches apart and that not more than 2 pounds of seed be sown per acre. If the stand is thick, little advantage is attained in the row over broadcast seeding. A thick stand can not be easily thinned, neither can an uneven stand be satisfactorily remedied; hence, the desirability of a uniformly thin stand at the beginning.

The press drill is probably the best implement for seeding, since by blocking up certain of the holes it can be made to seed in rows the desired distance apart.

Light rollers 15 to 18 inches in diameter and approximately 20 inches long can be used to follow after in the row seeded by the drill, in order to slightly compact the soil and to give the seed the necessary covering. These rollers can be made of lumber on the farm and attached to the drill in a frame. They are much more satisfactory than chains or the ordinary press wheels for covering the seed. Frequent cultivation should be given the field after the plants are well started, in order to conserve moisture and keep down the weeds. Until the alfalfa has made a heavy growth the weeder can be used to good advantage. After this an ordinary cultivator or beet cultivator can be used very satisfactorily, care being taken to not ridge the plants any more than is absolutely necessary, flat cultivation being highly desirable. At least three cultivations are recommended in ordinary seasons.

The growing of alfalfa in rows does not interfere with the cutting of the crop for hay, and the farmer who has not tested this method will be surprised at the increase in the yield from the rows over an ordinary broadcast field.

*Seed production in rows.*—For the production of seed the row method is not only more certain of producing a crop, but will invariably give a larger yield than a broadcast stand, since it affords better moisture conditions, more light to the individual plant, and doubtless other favorable conditions that are not well understood.

*Seeding broadcast.*—If for any reason it is desired to sow the seed broadcast, the general information already given regarding the preparation of the seed bed and the date of seeding is applicable to this method. The use of the press drill is advised for seeding in preference to the broadcast type of seeding, since by means of it a stand is more certain to be secured. If a broadcast seeder is used, the seed may be covered with the ordinary drag harrow quite satisfactorily; however, the weeder is much more certain to give good results. The rate of seeding varies with the soil, location, and rainfall; 15 to 20 pounds are usually sown, although 10 to 12 pounds are frequently recommended, especially in the northern half of the Great Plains region. The date of seeding broadcast is the same as for cultivated rows.

There is not sufficient evidence regarding the value of cultivation of broadcast fields to warrant definite recommendations. However, disking and harrowing should be tested thoroughly, leaving in each case a portion of the field untreated to serve as a check on the cultivated area. The spike-tooth harrow appears to give very good results for the first and possibly the second season. After this the use of a disk harrow or some type of renovator is advised. Severe treatment should not be given, as it injures the crowns of the plants and promotes the introduction of diseases.

*Suggestions.*—If further information is desired regarding the culture of alfalfa, either broadcast or in rows, or in regard to seed production, the Department of Agriculture will be pleased to furnish bulletins free upon request. The following Farmers' Bulletins on these subjects are available: No. 339, Alfalfa; No. 373, Irrigation of alfalfa; No. 495, Alfalfa seed production. Also Circular No. 24 of the Bureau of Plant Industry, entitled "Alfalfa in cultivated rows for seed production in semiarid regions."

R. A. OAKLEY, *Agronomist.*

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